

as this jaw presents; for the robust incisors may here be regarded as representing molars simplified by the partial loss of enamel, and with a change in their direction.

In the *second* molar, we find an increase in the antero-posterior diameter, and in the length of the tooth, and the enamel at the middle of the outer side makes a fold which penetrates a little way into the tooth; the line of enamel, on the inner side, is slightly concave and unbroken.

The *third* molar presents an increase of dimensions in the same directions as the second; the enamel on the outer side of the tooth presents a similar fold, but it is directed a little more backwards.

In the *fourth* molar, besides a further increase of size, and a corresponding but deeper fold of enamel in the external side of the tooth, we have the grinding surface rendered more complicated by two folds of enamel entering the substance of the tooth from the inner side: these folds divide the antero-posterior extent of the tooth into three nearly equal parts; they are both directed obliquely forwards, half-way across the substance of the ivory.

The *fifth* molar presents the same structure as the fourth, which it exceeds only slightly in size.

In the *sixth* molar we have a proportionally greater increase of size in the antero-posterior diameter, which measures two inches; but the lateral diameter is but slightly augmented; its structure resembles that of the fifth.

As these grinding teeth by no means increase in the lateral diameter in the same proportion as in their antero-posterior diameter, the posterior ones present, but in a greater degree, the compressed form which characterizes the grinders of the upper jaw of the *Toxodon*.

It will be seen, however, that there is a difference in the structure of the grinders in this fragment of the lower jaw and those of the upper jaw of the *Toxodon*. In the lower grinders there are two folds of enamel proceeding from the inner side of the tooth into its substance, whilst in the upper grinders there is only one fold continued from the inner side; in the lower grinders there is also a fold of enamel reflected into the substance of the tooth from the outer surface, while in the upper grinders of *Toxodon* we find the enamel coating on the outer side of the tooth merely bent inwards, so as to describe, in the transverse section, a gently undulating line; fig. 7, Pl. V. is the grinding surface of the sixth molar, right side, upper jaw.

But this difference of structure is by no means incompatible with the co-existence of the two series of teeth in the same animal, since we find the grinders of the upper and lower jaws presenting differences of structure of equal degree in existing herbivorous species. If we examine the jaws of the Horse, for example, we shall find not only an equal amount of difference in the structure of the upper

and lower grinders, but that they deviate from one another in a very similar manner to that above described in the *Toxodon*. In this comparison attention should be confined to the course of the external enveloping layer of enamel, leaving out of consideration the central crescentic islands of enamel which constitute the additional complexity of the Horse's grinder. Viewing then the course of the external coat of enamel on the worn surface of the tooth, we find it describing on the outer side of the tooth in the upper jaw an undulating line,—a middle convexity being situated between two concavities; on the inner side of the tooth one fold of enamel penetrates to the middle of the tooth, and on each side of this there is a smaller fold. But in the lower jaw the line of enamel on the outer side of the tooth, instead of merely bending outwards midway in its course, is reflected a little way inwards; while on the opposite, or inner side of the tooth, the enamel sends two extensive folds into the substance of the tooth, opposite to the interspace of which the shorter fold projects from the outer side. Now, on the supposition that the fragment of the lower jaw here described belongs to the *Toxodon*, the kind and degree of difference in the complexity of the grinding surface of the teeth in the upper and lower jaw, are remarkably analogous to those which exist in the Horse. I have only further to remark that in the Horse the inflected folds of enamel, instead of being simple and straight with the two constitutive layers in apposition, as in the *Toxodon*, are irregular in their course, with cœmentum intervening between the constitutive layers, which also diverge from each other at their angle of reflection, so as to augment the amount of dense material which enters into the composition of the tooth.

Many analogous examples will readily occur to the experienced comparative anatomist. The Horse has been adduced as one to which reference can very readily be made; but I would also cite the Sumatran Rhinoceros, the skull of which, in the Hunterian collection, has already been alluded to. In this species the anterior grinders, in both jaws, are small and simple, and increase in complexity as they recede backwards. The third superior grinder (fig. 8, Pl. V.) presents a single fold of enamel, reflected obliquely forwards from the inner side half-way across the tooth; the outer line of enamel describes a simply undulating line. The opposite grinder of the lower jaw (fig. 9, Pl. V.) has only one-half the breadth of the upper one, but has its grinding surface further complicated by having two inflected folds of enamel from the inner side, and one shorter and broader fold from the outer side. This tooth, therefore, presents a close resemblance to one of the posterior grinders of the lower jaw of the *Toxodon*, but differs essentially in being of limited growth, and consequently in having fangs.*

* Besides the relation to *food requiring much comminution*, which teeth with persistent pulps bear, they are also connected with the *longevity of the individual*. The term of life in a herbivorous animal, with grinders